



## Preliminary evaluation of lamb chill risk at the Edible Shelter project sites

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A variety of paddock conditions are known to contribute to the level of thermal stress experienced by a lamb in the critical few days after it is born. The weather conditions, landscape topography and shelter from vegetation and land features affect proximal conditions, while the ewes condition, access to feed, and its behaviour affect milk supply and combined with size of the lamb affect its resistance to cold stress. Therefore, the different combinations of these factors result in a different level of risk and likelihood of lamb mortality.

The risk profiles of lambing ewes were compared for 6 project locations across southern Australia, for the months of May, June and July using the GrassGro® pasture and ruminant grazing model. The probability that thresholds of various indicators would be exceeded in each month was determined using a daily time-step simulation based on 41 years of historic BOM weather and NASA Power wind data, for each site. The thresholds applied in GrassGro® for each of the indicators was as follows;

Indicator	Threshold
Green feed available	> 200 kg/ha*
Minimum temperature	< 0°C
Daily rain	> 5 mm
Average wind speed	> 4 m/s
Chill	> 1100 kJ/m <sup>2</sup> /h

\* This value represents green pasture that is accessible for grazing, which is a lower value than total pasture biomass.

The charts below compare risk indicators between locations for each of the three months. During May, risk of low feed supply was a higher for the WA sites (Baandee, Cranbrook, Dandaragan and Dongara), compared with the NSW sites (Boorowa and Young). In June and July the risk of low feed was much lower, but Baandee, Cranbrook and Dongara remained above 40% of days even during July.

The risk of low temperatures was higher for the NSW sites in all months, with about one third of days at less than 0°C during July. The frequency of rain events was higher for Dandaragan and Dongara, however these are the relatively warmer sites with very few days below the temperature threshold. Boorowa, Cranbrook and Dongara had the highest incidence of wind conditions above the threshold for each of the months.

The GrassGro chill index, which integrates wind, rain and temperature, indicated that the chill risk generally increased from May to July across the project sites. However, the NSW sites had the highest chill risk of the sites with Boorowa exceeding the chill risk threshold for almost 20% of days in July, compared with Baandee where high chill risk events were rare. On the other hand, WA sites had a much higher risk of poor feed earlier in the season. These results support different feed and shelter considerations for the project sites, with a focus on early feed provision in WA compared with prioritising shelter to reduce chill stress at the NSW sites.

**Percent of days exceeding thresholds by location (1981-2021)**

